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4797

25 August 1975

MEMORANDUM FOR: Mr. John K. Boidock
Chief, Electronics Branch
Office of Export Administration
Department of Commerce

SUBJECT : Soviet Instruments

1. Attached are technical specifications for five Soviet instruments which you requested from of this office.

2. Two of the instruments, the Ch1-46 and R4-11, probably are still in the prototype stage. They are listed as scheduled for production by the end of 1976. The remaining three are listed as being in production.

3. Please address any questions to

Office of Economic Research

Attachment:
as stated

(S-08906)

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ATTACHMENT

Hydrogen Frequency Standard Ch1-46

The Ch1-46 is intended for use as a reference generator in various measuring systems for the most precise frequency time, and phase measurements, and likewise in systems demanding a very stable, high precision, spectrally pure sinusoidal signal.

It has been built completely with transistors and integrated circuits. It is designed for long periods of continuous operation. It demonstrates a great technical capability in the improved technology of coating the storage flask, and in the optimization of the construction of the system for forming the beam of atomic hydrogen.

Specifications

Output frequencies	0.1, 1, 5 MHz
Output voltage	at least 1 volt into 5 ohms
Systematic deviation from nominal value of the output	4×10^{-11} maximum
RMS error of the output signal	3×10^{-13}
Frequency instability	1.5×10^{-12} over 1 second
	3×10^{-13} over 10 seconds
	4×10^{-14} over 100 seconds
	5×10^{-14} over 1 hour
	7×10^{-14} over 24 hours
Size	570 x 572 x 1900 mm
	330 kg.

Complex Transmission Coefficient Meter R4-11

The instrument is designed for the visual observation research, and measurement of complex reflection coefficients, transmission coefficients (amplification, attenuation, phase), and phase comparison between two signals in the frequency range 1-1250 MHz. The measurements are displayed immediately on a CRT screen in Polar or rectangular coordinates.

Specifications

Frequency range	1-1250 MHz
Measurement range	
SWR	1.05-2
amplitude	+10 to -60 dB
phase	0 $\pm$ 180°
Resolution	
amplitude	0.2 dB
phase	2°
Error	
SWR	3-5%
attenuation	0.5 dB + 0.05 (input attenuatior
phase	10° (SWR=2)
Dimensions	
sweep generator	480 x 160 x 420 mm
indicator	480 x 320 x 420 mm
Weight	58 kg

Calorimetric Absorbed Power Meter MK3-18A

The MK3-18A measures the power of CW lasers or the energy of single pulses. Power is indicated by a deflecting meter, energy is indicated digitally. The large input window significantly simplifies alignment, materially shortening measurement time. There is an output to a chart recorder, which permits automating the process of power measurement.

Specifications

Wavelength range	0.4 - 3.5 microns
Measurement range	0.1 - 10 milliwatts
	1-300 millijoules
Measurement accuracy	10% (power)
	20% (energy to 3 millijoules)
	10% (energy above 3 millijoules)
Measurement time	20 seconds
Input window diameter	10 mm
Dimensions	
Indicator	480 x 120 x 475 mm
Head	340 x 309 x 130 mm
Weight	
Indicator	19 kg
Head	12 kg

Microwave Panaramic Spectrum Analyzer S4-42

The S4-42 is designed for observation and relative measurement of spectra of repetitive RF pulses and continuous CW signals with a wide display bandwidth.

It consists of a mixer unit, a spectrum analysis unit, a set of external filters, and external waveguide mixers. It differs from other microwave spectrum analyzers in its wider display bandwidth (1300 MHz) and the presence of microwave filters, which pass the range of frequencies within the limits of each subrange, reducing the number and level of intermodulation products. The frequency range is divided into four subranges: 40 MHz-2.5 GHz, 2.5-8.3 GHz, 8.3-15 GHz, 15-17 GHz.

Specifications

Range of frequencies	40 MHz-17 GHz
Displayed bandwidth, MHz	0.1-5, 10-1300
IF bandwidth (3 dB), KHz	3-70, 1 and 300
Internal noise, dBm	-125 (40 MHz-2.5 GHz)
	-120 (2.5-8.3 GHz)
	-110 (8.3-15 GHz)
	-105 (15-17 GHz)
Maximum input signal	10 microvolts to the mixer
Dynamic range, dB	50
Residual FM	35 KHz unstabilized
	300 Hz stabilized

Microwave Panoramic Spectrum Analyzer S4-42

Specifications (continued)

Nonlinearity of frequency, dB	10
Attenuator calibration error, dB	1-1.5
Frequency error	1%
Frequency interval error	0.01 interval + IF bandwidth
Input impedance	50 ohms
Sweep speed	0.02-2 seconds
Size	480 x 255 x 475 mm
	480 x 325 x 475 mm
Weight	85 kg

Frequency Synthesizer Ch6-58

The Ch6-58 provides spectrally pure signals of high stability. It is intended for investigation of the characteristics of narrowband filters, in systems of narrowhead and synchronized radio communications as a local oscillator or exciter, in doppler radionavigation systems, and for investigation of amplitude and phase characteristics of active and passive four-terminal networks. The synthesizer is widely used in automatic control systems and automated data-measuring systems.

The frequency and level of the output signal is programmable and remotely controllable.

Specifications

Frequency range	50 Hz-50 MHz in 0.01 Hz steps
Voltage into 50 ohm load	1 volt $\pm$ 3 dB
Voltage range	0-60 dB in steps of 10 dB
Stability of internal standard	3×10^{-8} over 24 hours
Level of spurious output	
Harmonic	-60 dB
Nonharmonic	-70 dB
Size	
Oscillator unit	480 x 120 x 475 mm
Synthesis unit	480 x 280 x 475 mm
Weight	65 kg